

Adding and Subtracting Fractions with Unlike Denominators

Fractions with different denominators, or **unlike denominators**, represent pieces of different sizes. In order to add or subtract fractions with unlike denominators, you need to change them to equivalent fractions with the same denominator.

You can find equivalent fractions by either multiplying or dividing the numerator and the denominator of a fraction by the same nonzero number. The **least common denominator** of two fractions is the least common multiple of the two denominators.

— Example —

Simplify $\frac{3}{4} - \frac{1}{2}$.

Find the least common denominator for $\frac{3}{4}$ and $\frac{1}{2}$ by listing multiples of both denominators.

Multiples of 4: **4**, 8, 12, 16

Multiples of 2: 2, **4**, 6, 8

The least common multiple of 4 and 2 is 4. So, 4 is also the least common denominator. Only $\frac{1}{2}$ needs to be changed to an equivalent fraction.

Multiply numerator and denominator by 2 to make the denominator 4.

$$\frac{1}{2} = \frac{1 \times 2}{2 \times 2} = \frac{2}{4}$$

Rewrite the expression using equivalent fractions.

$$\frac{3}{4} - \frac{1}{2} = \frac{3}{4} - \frac{2}{4}$$

Subtract.

$$\frac{3-2}{4} = \frac{1}{4}$$

Since $\frac{1}{4}$ is in lowest terms, $\frac{3}{4} - \frac{1}{2} = \frac{1}{4}$.

Try It Simplify $\frac{5}{12} + \frac{1}{4}$.

a. Find the least common multiple of 12 and 4. _____

b. Write as equivalent fractions. $\frac{5}{12} =$ _____ $\frac{1}{4} =$ _____

c. Rewrite the expression. _____

d. Add. Write in lowest terms. _____

Simplify.

e. $\frac{5}{6} - \frac{2}{3}$ _____

f. $\frac{3}{8} + \frac{1}{4}$ _____

g. $\frac{2}{3} - \frac{1}{5}$ _____

h. $\frac{1}{12} + \frac{2}{3}$ _____

i. $\frac{3}{5} - \frac{1}{10}$ _____

j. $\frac{7}{10} - \frac{1}{4}$ _____